

Highlighting innovative design features  
and useful application information for  
**Thermo Scientific Temperature Control**

# smart notes

operation/installation tips ► Bath Circulators

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# Q A

**I need a specific, controlled rate of heating (i.e. temperature ramp). How do I ensure that my heated bath circulator will be able to control to that temperature rate?**

**Optimize the installation:** If you have already purchased a bath that is not keeping up with your temperature ramping requirements, there may be more performance already available to you. Taking steps to achieve the best thermal performance by minimizing mass, maximizing heat transfer to your application, and minimizing heat loss to the room will decrease the time it takes to achieve set point. If your unit is still not keeping up with your ramp, adding a Boost Heater accessory will improve ramp performance. A Boost Heater accessory works by safely and conveniently adding 40% to 100% more wattage to what your heated bath circulator already has.

**Optimize selection:** Before selecting a bath circulator talk with one of our application specialists. They can help you determine if your application requires more heat than a heated bath circulator alone can provide. This is achieved by combining the Boost Heater accessory with the heated bath circulator for a perfect fit.



# what can I do?

## How to optimize the installation for controlled temperature ramping

### Heat loss:

Often a bath circulator starts out following the temperature ramp set by the user, but then lags behind. This is an indication that too much heat is lost to the room or the size of the heater is inadequate.

### SOLUTION:

Heat losses to ambient can be reduced by insulating the application (if possible) and using the shortest hoses possible with insulation that is appropriate to the temperature.

### Heating a large mass:

When the bath circulator fails to keep up with the temperature ramp it is an indication that the mass being heated is too large or the heater is too small.

### SOLUTION:

Heating a large mass requires more heating power to follow the temperature ramp. When considering mass, you have to look at everything that heats up, not just the application – remember to also include the fluid that is in the bath and the hose. It is unlikely that you can reduce the mass of your application. But you can reduce the fluid mass by using the smallest bath and the shortest hoses to maximize the heat available for the application.

### Poor heat transfer:

When the internal temperature of the bath keeps up with the temperature ramp, but your application temperature does not, it is an indication that there is poor heat transfer between the fluid and the application.

### SOLUTION:

To maximize heat transfer, use short hoses with a larger inner diameter (12mm rather than 8mm) and run the pump at the highest speed possible to improve flow.

## Boost Heater

If you have optimized as suggested and performance is still inadequate, then a Boost Heater accessory may be the solution. Depending on what is needed, this is available with 1200W or 1600W of additional heat. This accessory is available with the Thermo Scientific™ ADVANCED and PREMIUM heated immersion circulators that can be matched with Thermo Scientific™ S7, S13 and S30 heated baths as well as the Thermo Scientific™ A28 and G50 refrigerated/heated baths.

## Summary

When you need to control the temperature ramping of your application, be sure you have accounted for heat loss, mass, and poor heat transfer. If your bath circulator cannot maintain the required temperature ramp, adding a Boost Heater accessory will give you the control you need.

Visit [www.thermoscientific.com/tctechlibrary](http://www.thermoscientific.com/tctechlibrary) for product brochures and detailed application notes.

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